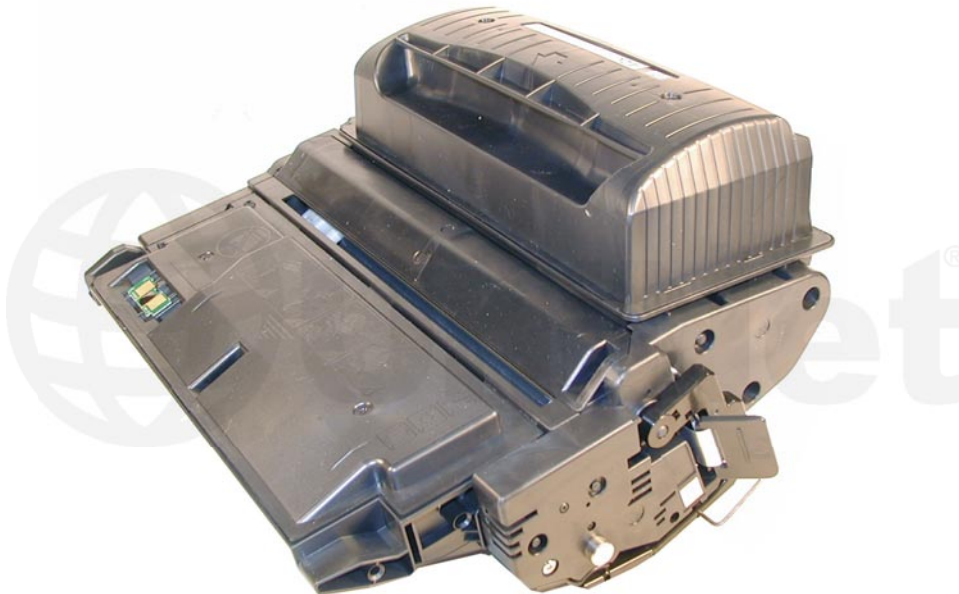


HP® LASERJET 4200 • 4250 • 4350

TONER CARTRIDGE REMANUFACTURING INSTRUCTIONS



38A/42A TONER CARTRIDGE



39A/42X TONER CARTRIDGE

REMANUFACTURING THE HP LASERJET 4200/4250/4350 TONER CARTRIDGES

By Mike Josiah and the Technical Staff at UniNet

First introduced in October 2004, the HP LaserJet 4250 engine is a 45ppm, 1200 dpi engine, the HP LaserJet 4350 is a 55ppm, 1200 dpi engine, both made by Canon. The Q5942A cartridge is rated for 10,000 pages at 5% coverage, and the Q5942X cartridge is rated for 20,000 pages at 5%. As with the HP 4200, the chip mainly controls the “toner low” functions and of course the “HP/Non-HP Cartridge” message.

These instructions cover both the “A” and “X” cartridges. Unlike the 4200 and 4300 cartridges, these are interchangeable. Both the A and X cartridges can go into either machine. They will not however fit into the 4200/4300 machines. Many changes have been made to prevent this. The only major exception is removing the wiper blade on the 42X cartridge. The 42X cartridge has a plastic shelf that must be removed in order to remove the wiper blade. The 42A cartridge does not have this shelf.

At first glance, these cartridges look very similar to the 38A/39A cartridges, but upon closer inspection, there are many subtle differences. There have also been many changes made to make opening up the cartridge more difficult. HP may publicly tout that they are friendly to our industry, but more and more their cartridge design is proving other wise.

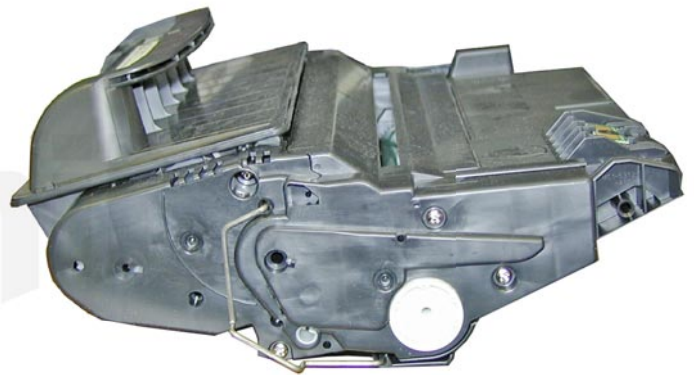
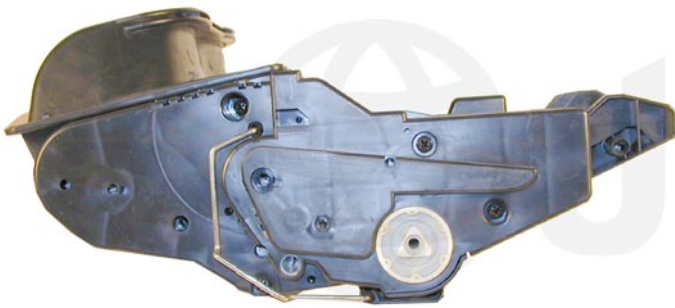
The following images show the difference between the four cartridges:



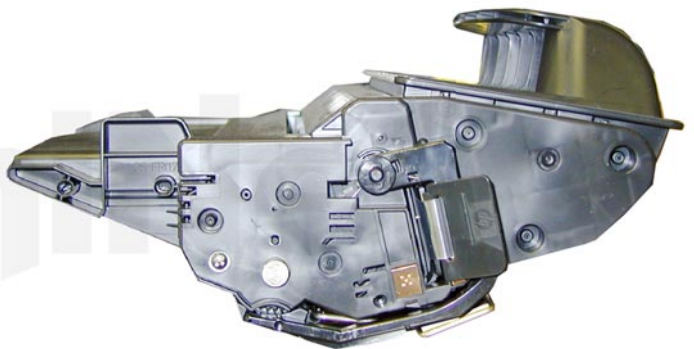
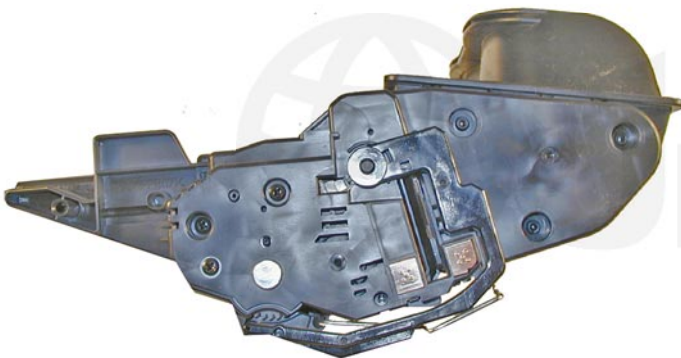
Top of 38A/42A



Bottom of 38A/42A



Right side 38A/42A



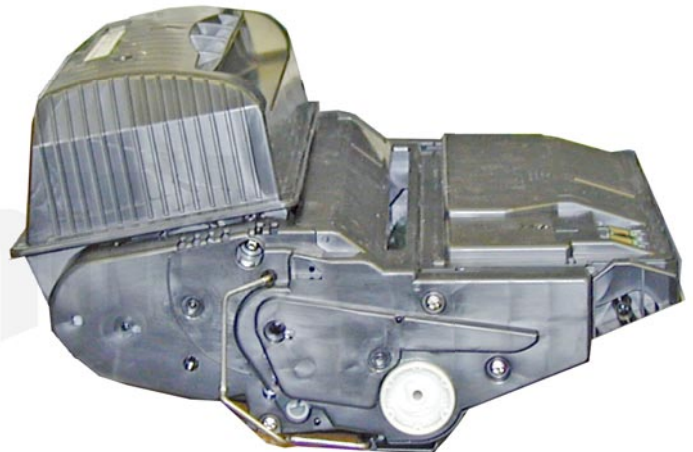
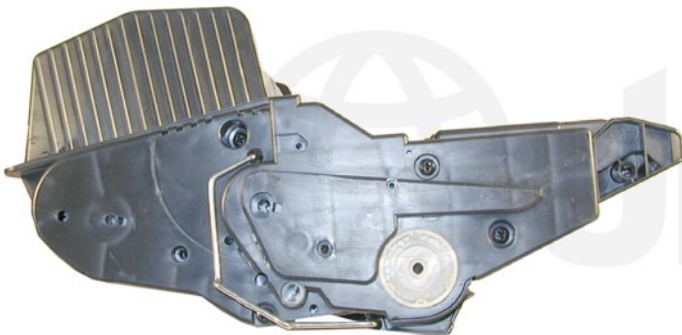
Left side 38A/42A



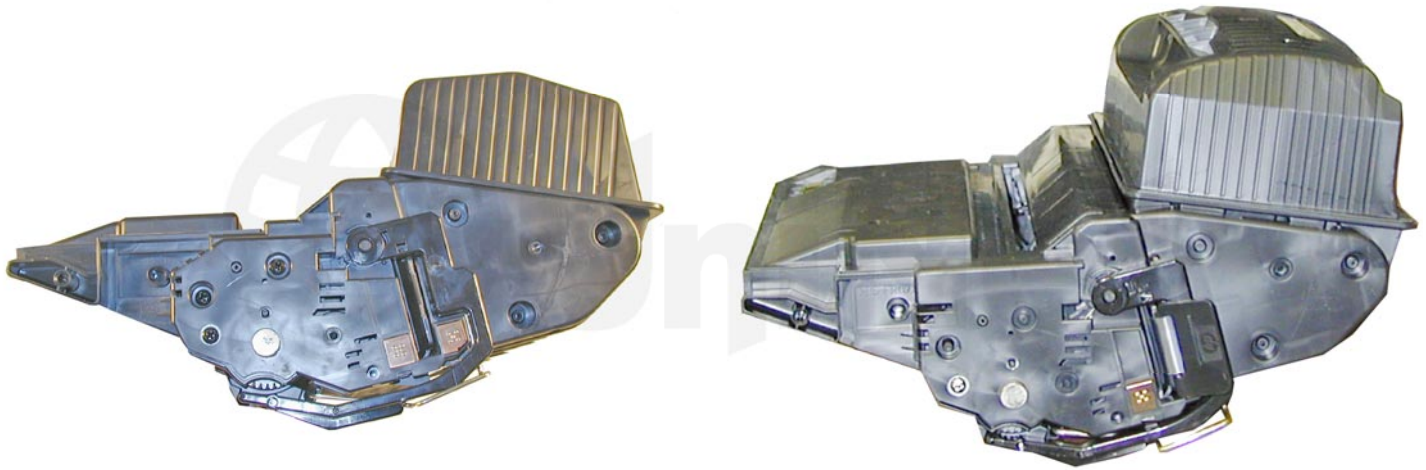
Top of 39A/42X



Bottom of 39A/42X



Right side 39A/42X



Left side 39A/42X

As you can see, HP and Canon seem to have gone out of their way to design them so that they cannot be made interchangeable with the 38X/39X cartridges. Testing is ongoing to see which if any cartridge components from the 38A/39A cartridges can be used in these cartridges.

CURRENT MACHINES THAT USE THESE NEW CARTRIDGES

HP LaserJet 4250
HP LaserJet 4250n
HP LaserJet 4250tn
HP LaserJet 4250dtn
HP LaserJet 4250dtnsl
HP LaserJet 4350n
HP LaserJet 4350tn
HP LaserJet 4350dtn
HP LaserJet 4350dtnsl

OPTIMIZE MODE

There is one new setting available in the printer menu known as the “Optimize” mode. There are three possible settings in this mode:

High Transfer: This should be set to “ON” if the paper being used is of a low quality. The manual does not indicate what this setting actually does. From the name, it sounds like the settings of the power supply are changed for the transfer roller, but it could also be the fuser setting. Hopefully the service manual when released will clarify this.

Line Detail: This should be set to “ON” to improve the appearance of lines on the page.

Restore Optimize: Returns the printer to the default OPTIMIZE settings.

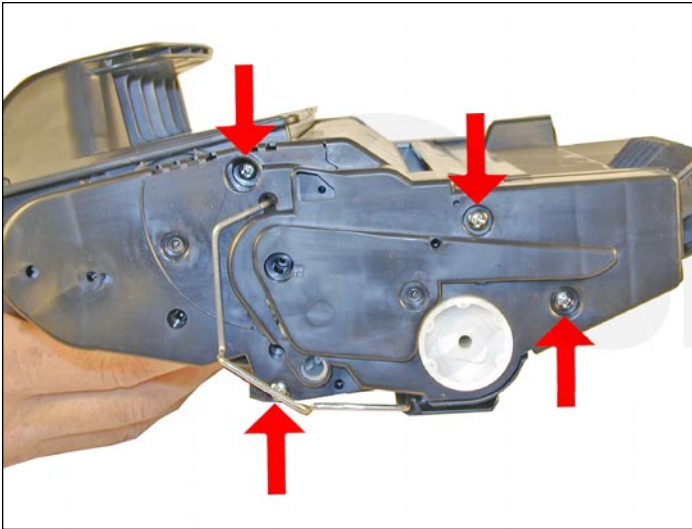
Printer usage, as well as some common printer/cartridge problems will be covered at the end of this article.

REQUIRED TOOLS

1. Toner approved vacuum
2. A small common screwdriver
3. A Phillips head screwdriver
4. Needle nose pliers
5. Dremel tool for removing wiper blade shelf on 42X cartridges
6. Magnetic roller press

SUPPLIES NEEDED

1. Toner
2. Replacement drum
3. Replacement chip
4. Wiper blade
5. Doctor blade
6. PCR
7. Magnetic roller sleeve
8. Conductive grease
9. Tube of silicon for sealing wiper blade gap (see text)

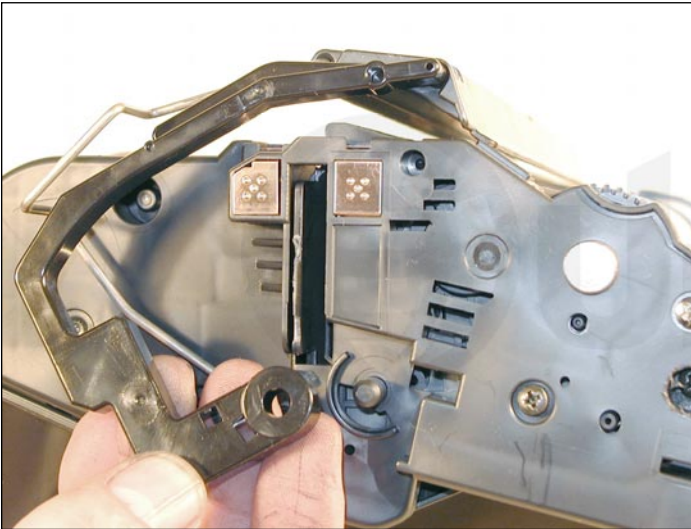


1. Place the cartridge with the toner hopper facing up and away from you. This will orient the cartridge for right and left sides. Remove the four screws on the left side end cap.

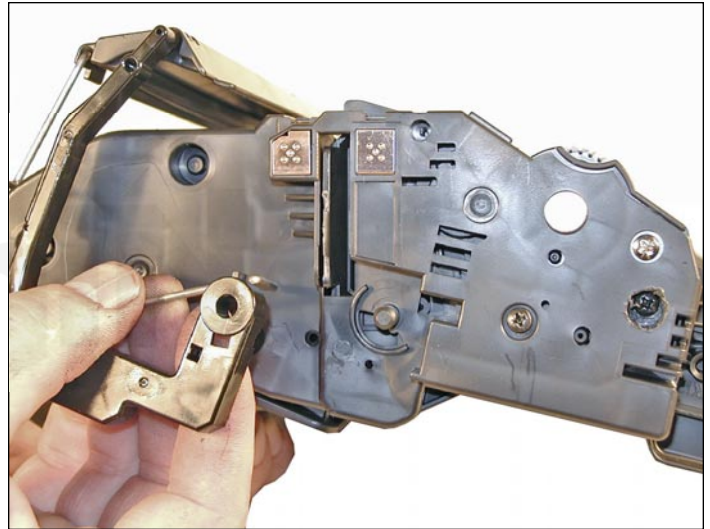


2. Open the drum cover towards the back of the cartridge.

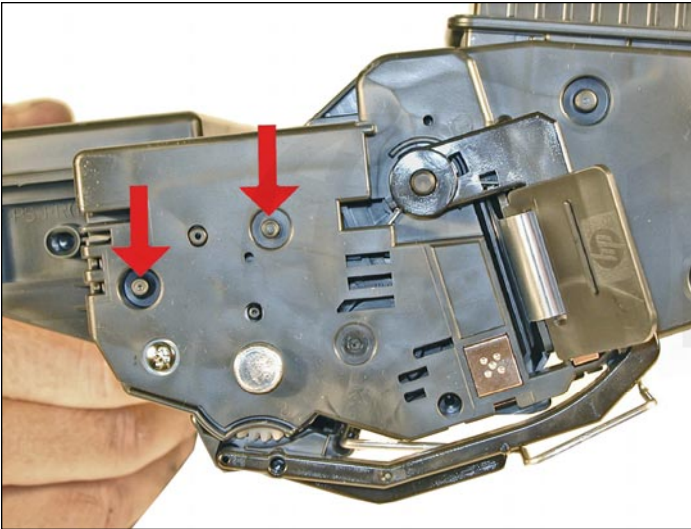
Remove the left side metal bar



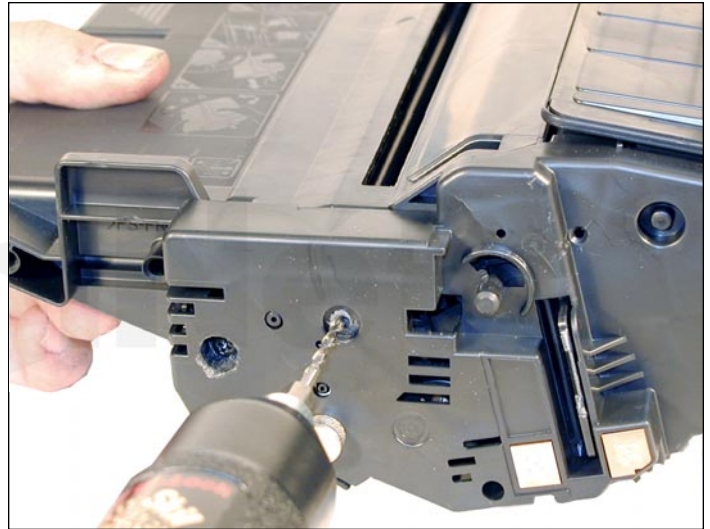
3. Carefully pry off the drum cover plastic arm. The spring will probably pop off, so take care not to lose it. We will go over the installation at the end of this article.



4. Remove the metal bar from the right side and remove the entire drum cover assembly. Make sure you put the spring in a safe place.

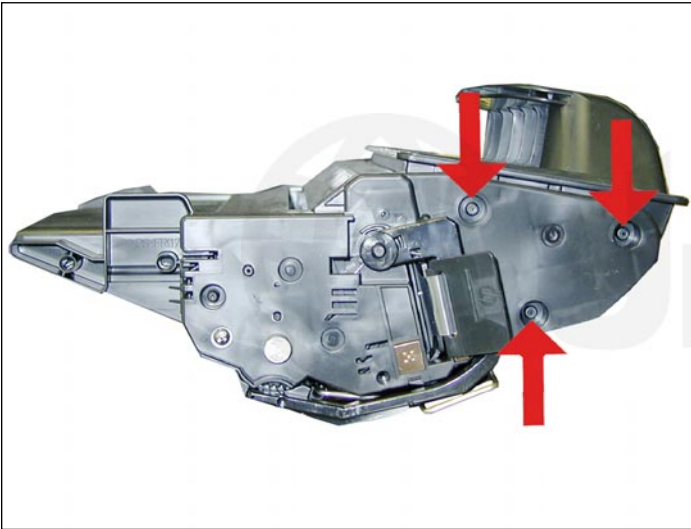


5. Drill out the two plastic rivets as shown.

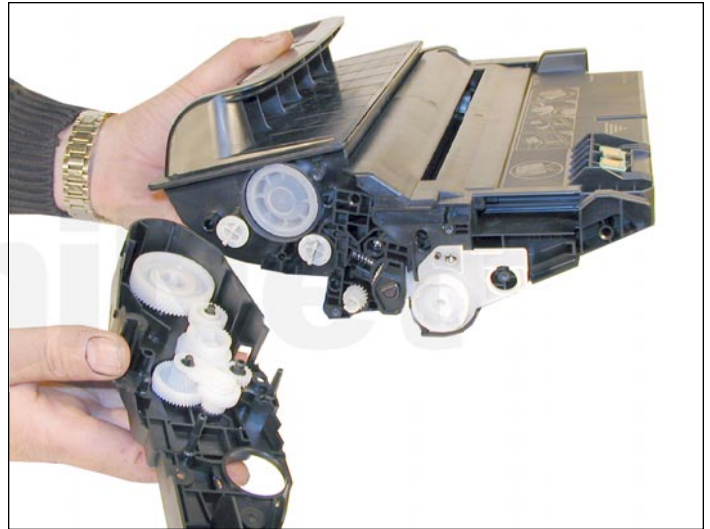


Just drill enough now to allow the end cap to come free. The rest of the hole will be drilled later.

Do not remove the screw that is holding the recessed metal drum axle pin.



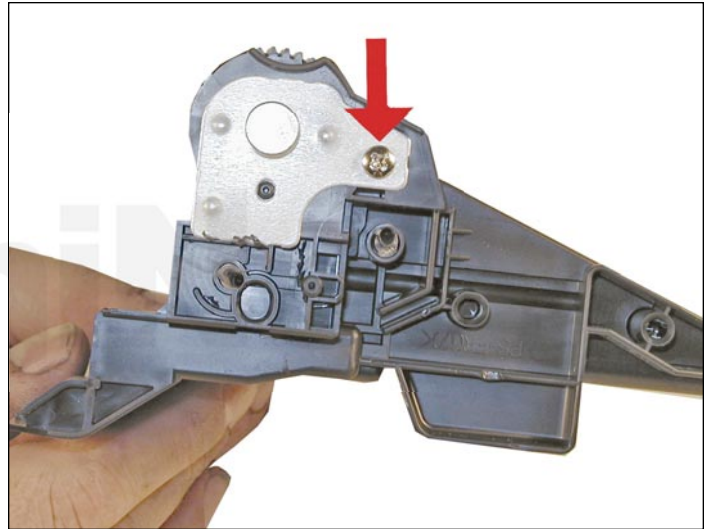
6. The rest of the right side end cap is held in place by three melted plastic posts. Although there are tools to aid in removing this end cap, we have found it not necessary. After removing and replacing the waste chamber a few times, a technician will be much faster than going through the trouble to remove the end cap.



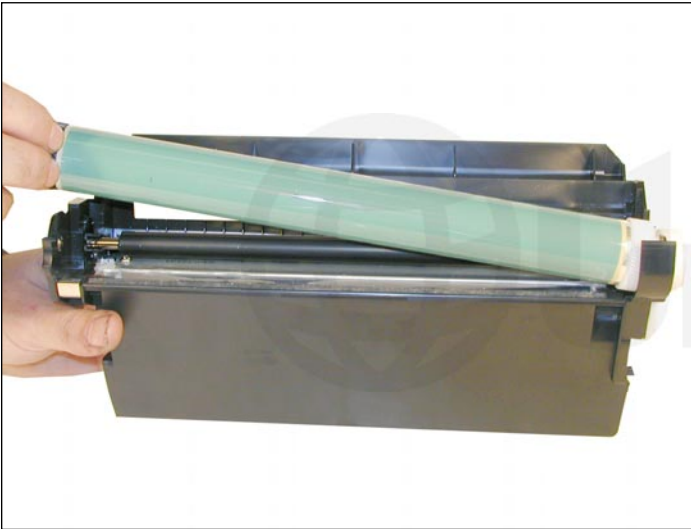
7. Remove the left side end cap from the cartridge.



8. Carefully work the waste chamber loose from the right side end cap. Press in on the metal drum axle pin to help free it.



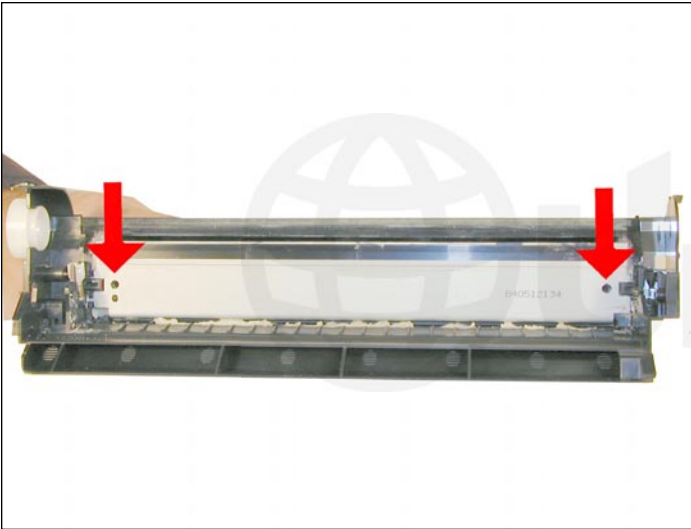
9. Remove the metal drum axle pin screw and the axle pin.



10. Remove the drum.



11. Remove the PCR.



12. Remove the two screws from the wiper blade.



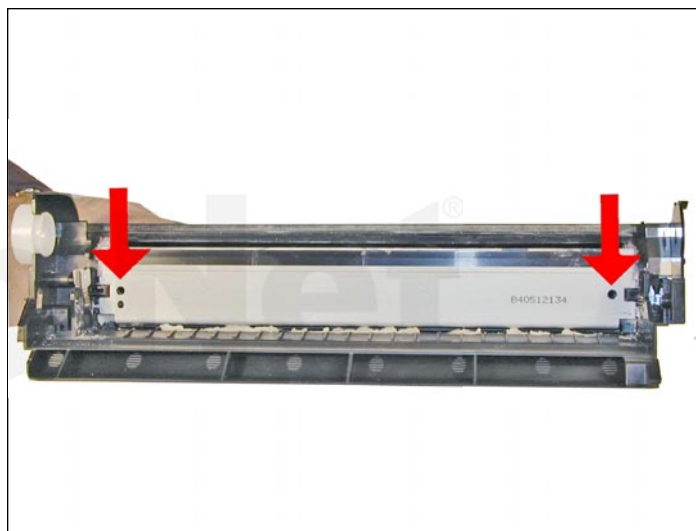
13. With a razor knife, carefully lift up the seal foam and cut away. This is very sticky, and the best way to remove it is to cut and lift. The wiper blade can be resealed with a good quality silicon caulk. Make sure you use the type that never dries up (it cannot be painted). This foam seal is apparently a cheaper way to seal the cartridge instead of using a foam gasket. Although it is a real pain to remove, replacing it with silicon will allow you to easily peel it of the next cycle.



14. At first glance, the 42A/X wiper blade is the same as the 38A/39A. Due to the high speed and page counts of these cartridges, we recommend that they be replaced.

It should be noted that the 42X cartridge has a plastic shelf across the wiper blade that prevents it from being removed and replaced. This shelf is best removed by a Dremel type tool with a grinding bit, or a circular blade bit. We do not recommend that a knife be used, as it can easily slip cutting yourself. This is identical to the 39A cartridge.

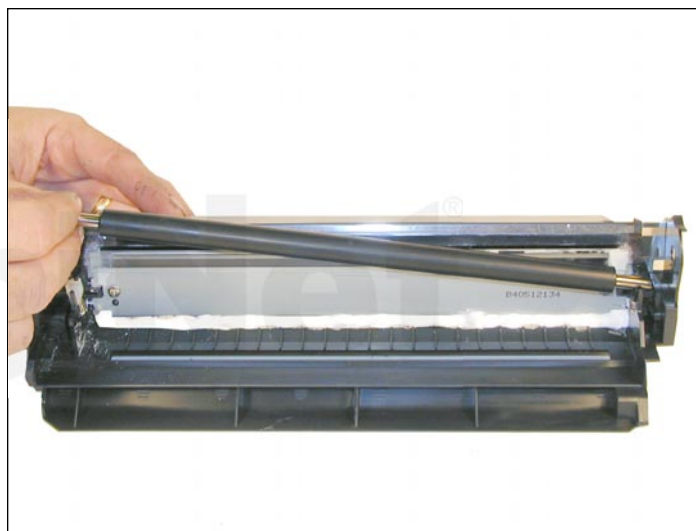
Remove the wiper blade from the cartridge, and clean out the waste toner. Clean the PCR with your standard PCR cleaner.



15. Install the wiper blade and two screws.



16. Seal the back edge of the wiper blade with a good quality silicon caulk. Use the type that never dries (cannot be painted). Let the caulk dry for a few hours before doing anything else.



17. Install the cleaned PCR. Place a small amount of conductive grease on the black PCR saddle. Remember, when using conductive grease, more is not better!

DRUM GEAR CHANGE

UPDATE: If you are replacing the drum, the gears will need to be changed over from the OEM to the new. There are two methods of removing the gears from OPC drums: The first and easiest method is to place the drum in a metal vice approximately 2" back from the gear, and slowly tighten the vice. The gear should pop out easily. This is the only method you can use on the OPC drums, which have a weighted slug in the center. If you use this method go on to step #3. The other method is as follows.

REQUIRED TOOLS AND MATERIALS

1. A 1/4" x 15" metal rod
2. A 1" x 15" wooden dowel
3. A tube of super glue
4. A small piece of emery-cloth or sand paper

Step #1: Removing the drive gear

The drive gear is the gear that has no metal electrical contacts in it. These gears are usually larger than the contact gear.

- A. Carefully insert the 1/4" metal rod into the center of the gear that has the contacts, or the contact gear.
- B. Angle the rod so that the rod presses against the edge of the opposite gear. The rod should be touching both the inside of the OPC Drum and the edge of the gear.
- C. Tap the end of the rod with a hammer, working the rod around the entire edge of the gear, until the gear comes loose.

NOTE: Gently heating the ends of the drum with a hair dryer or heat gun on low may cause the glue to soften and ease in the removal process. Just be careful not to use too much heat and melt the gear!

Step #2: Removing the "contact" gear

- A. Insert the 1" wooden Dowel into the gearless end of the drum.
- B. Tap the dowel with a hammer until the gear comes loose.

Step #3: Removing any old adhesive from the gears, straightening out any damage done to the contact gears' metal contacts.

- A. Removing the adhesive can be done with a small sharp common screwdriver. The glue comes off easily.

Step #4: Install the gears on the new replacement drum

- A. Inspect the metal contacts on the contact gear. Make sure that the contacts will make proper contact with the inside of the OPC drum.
- B. Locate the side of the drum on which you are going to place the contact gear. On some OPC drums, this is critical. See individual instructions for more information.
- C. Lightly sand the INSIDE of the OPC where the metal parts of the contact gear will meet. This will insure a good electrical contact.
- D. "Dry fit" the contact gear in the OPC drum and check for a good contact with an Ohmmeter. The reading should be a direct short, or no more than 1 or 2 Ohms.

NOTE: When checking the contact, place one lead on the drum axle contact and the other on the edge of the drum. This way, you will not have to pierce the coating that is on the OPC surface. A retail electronics store, such as Radio Shack carries cheap Ohmmeters for less than \$10.00 USD, and a sales person would normally be glad to show you how to use it.

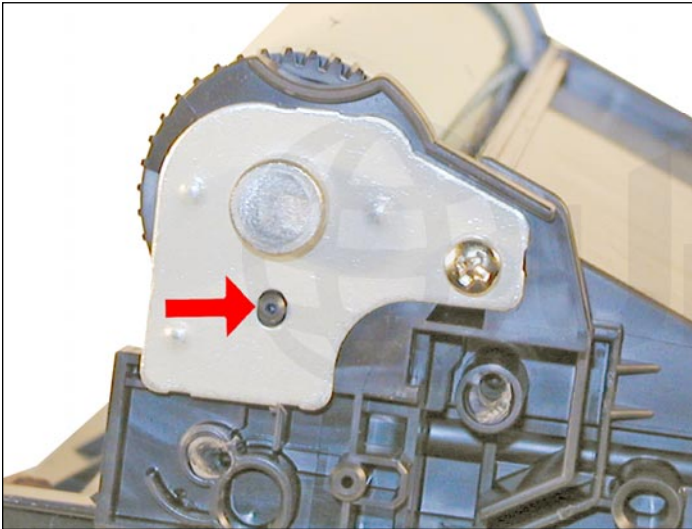
- E. Using the super glue, place a few (3-4) small drops of glue strategically around the inside edge of the OPC drum. Make sure you leave a blank area for the metal contacts!

F. Insert the contact gear.

G. Check for continuity again with the Ohmmeter.

H. Repeat steps E and F for the drive gear.

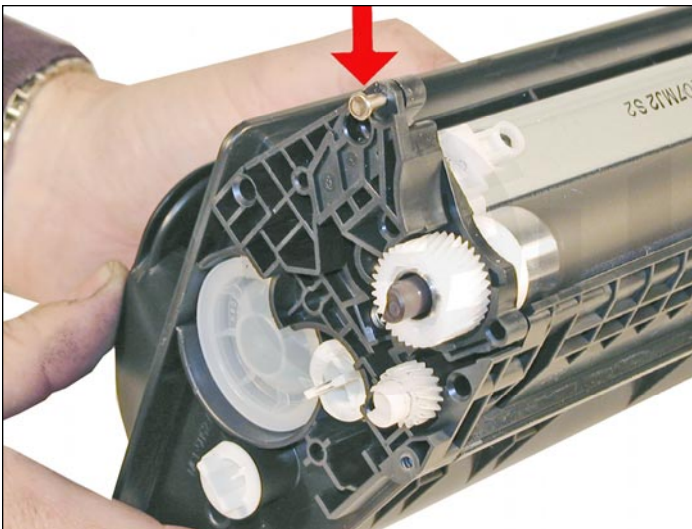
NOTE: Be very careful not to place the metal contacts in direct contact with the glue, as this will interfere with the proper grounding of the drum, and the cartridge will not print properly, (solid black pages). It is also very important to NOT put any glue on the gear, as the chances of it dripping out onto the drum surface and ruining it are high. Placing the glue inside the drum tube works much better.



18. Install the drum, drum axle pin and screws. Make sure that the plastic pin is centered in the oblong hole of the metal axle pin (just like the HP 4000 cartridges).



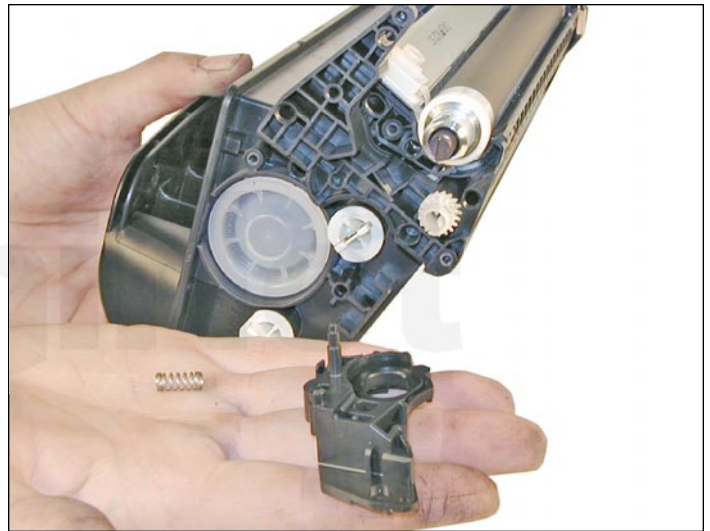
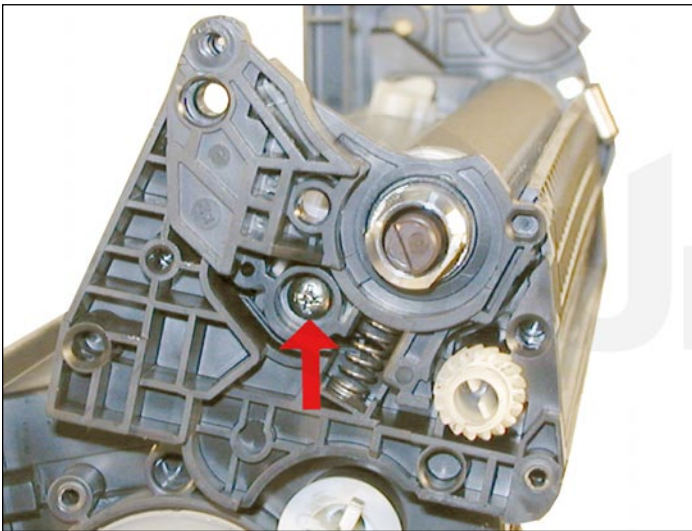
19. On the supply chamber, carefully pry off the magnetic roller (MRS) cover and remove.



20. Remove the small metal pin from the MRS holder.



21. Remove the MRS drive gear.

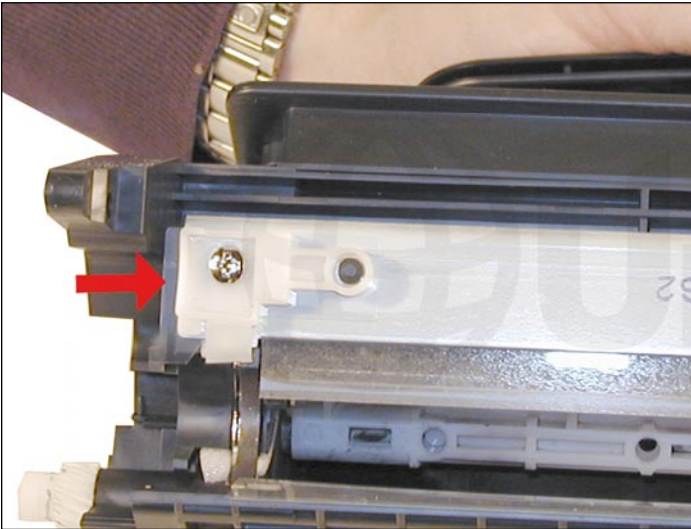


22. Note the location of the spring that sits between the MRS holder and the hopper.

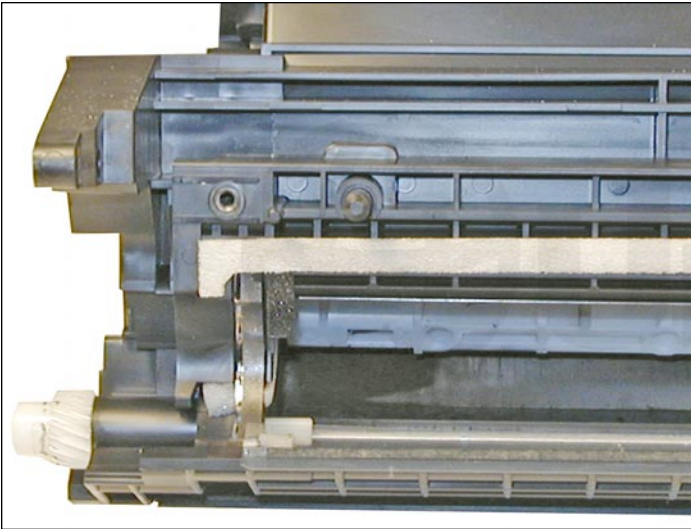
Remove the screw, spring and the holder.



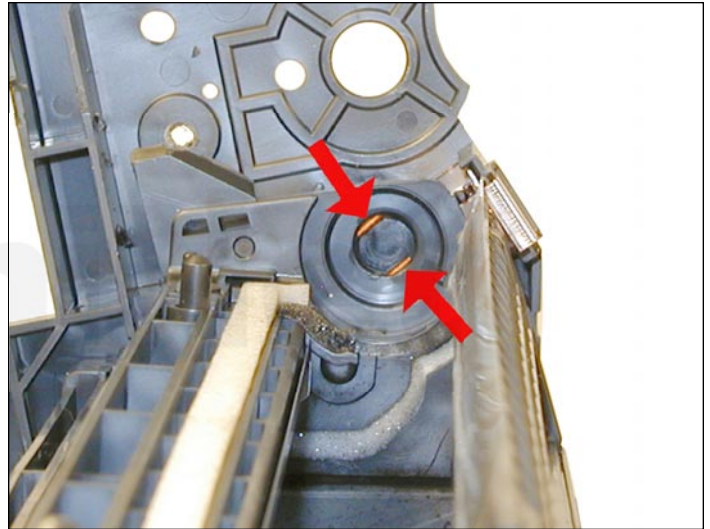
23. Remove the MRS assembly.



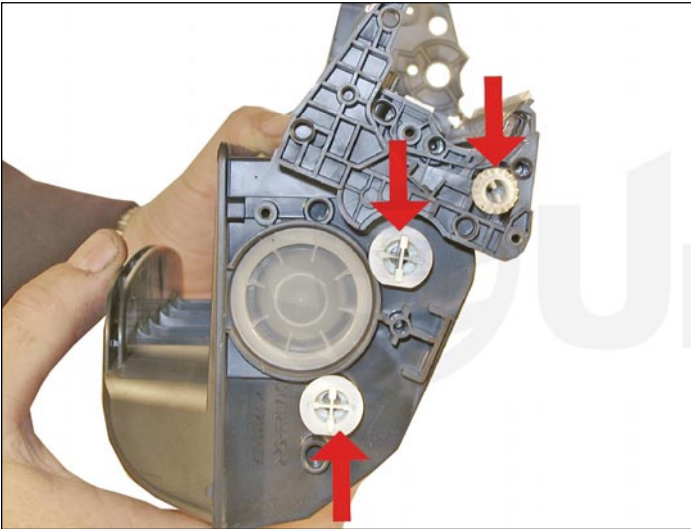
24. Remove the two doctor blade screws and the doctor blade. Note the clear spacer that fits in between the blade and the white plastic spacer. Do not lose this spacer or light print will occur. Clean out all the remaining toner in the supply hopper.



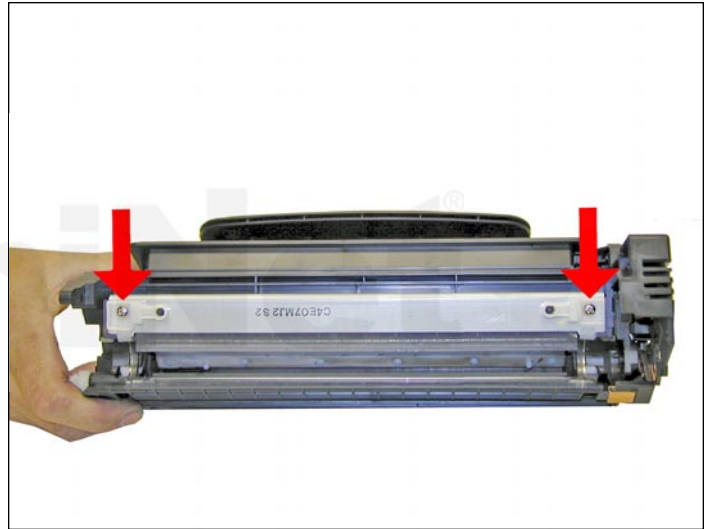
25. Note the magnetic seals on the MRS and the doctor blade sealing foam. Make sure both are clean.



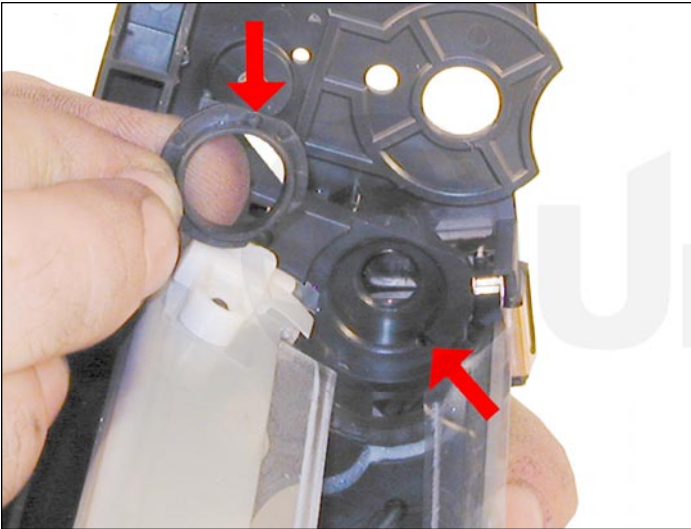
26. Note also the new style magnetic roller contact. There are two copper fingers that fit top and bottom on the magnetic roller. This when combined with the new larger diameter of the roller, allow the cartridge to run at the higher speeds that both machines are capable of.



27. There are three separate mixing blades in the toner hopper. The largest is on the bottom, with the smallest on the top. Each is driven by its own separate drive gear. The entire upper half of the toner hopper is different in that it “floats” on a series of foam seals. The upper half can be removed from the hopper, but some of the seals will be destroyed. This may become necessary in order to seal the cartridge.

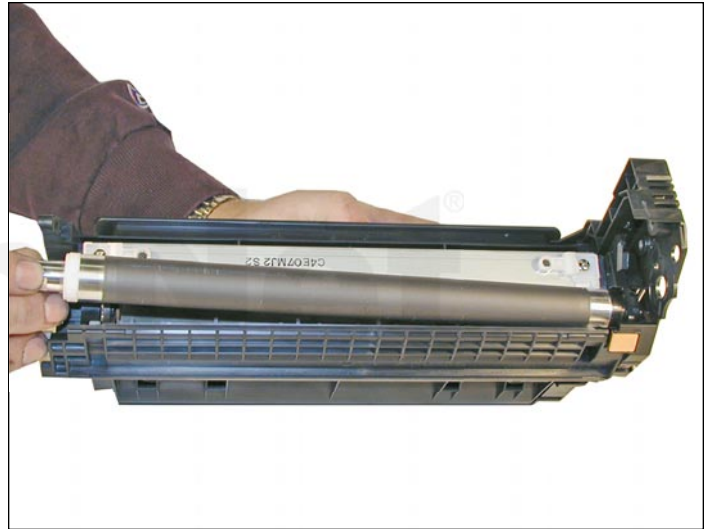


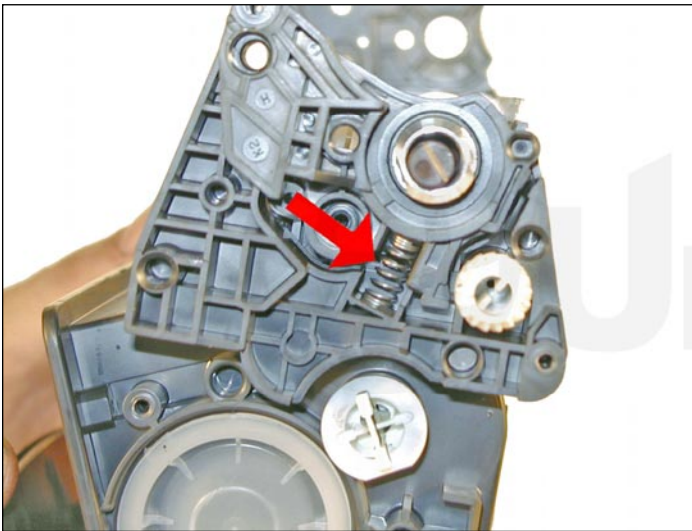
28. Install the doctor blade and two screws (make sure that all the spacers both clear and white are seated correctly!).



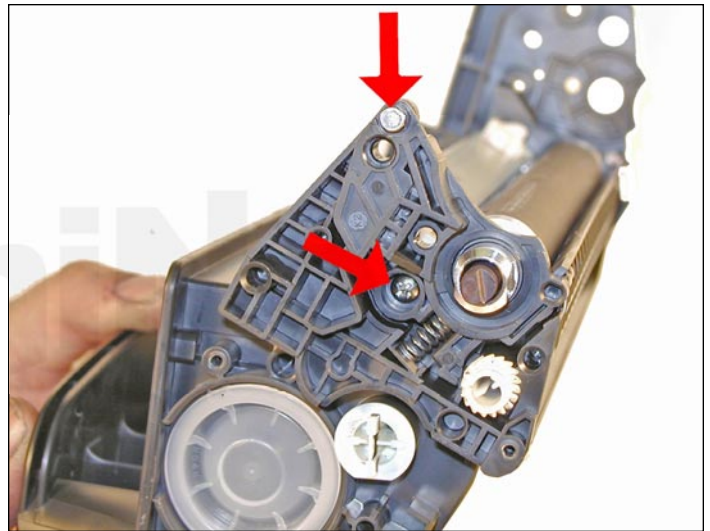
29. On the MRS there is a small hub that is keyed into the MRS holder

Align the hub with its slot and install the hub as well as the entire MRS assembly.

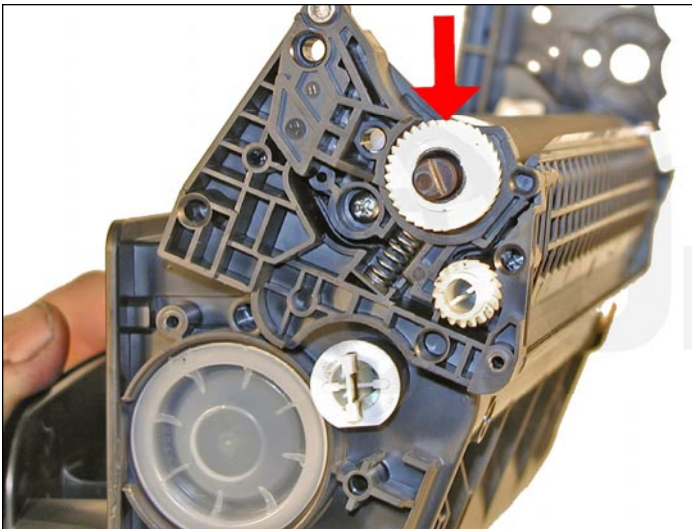




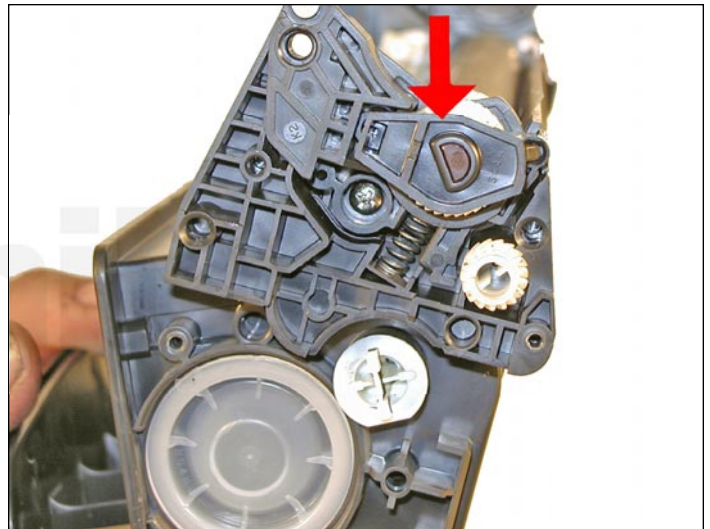
30. Install the holder and spring.



31. Install the screw and the small metal pin.



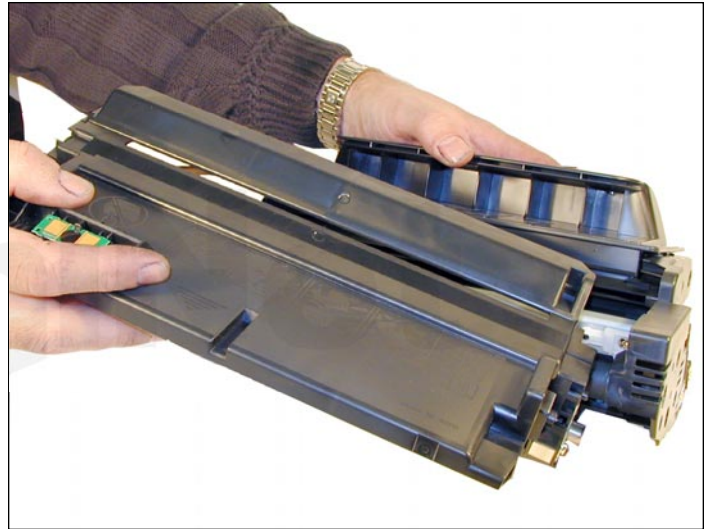
32. Install the MRS drive gear.



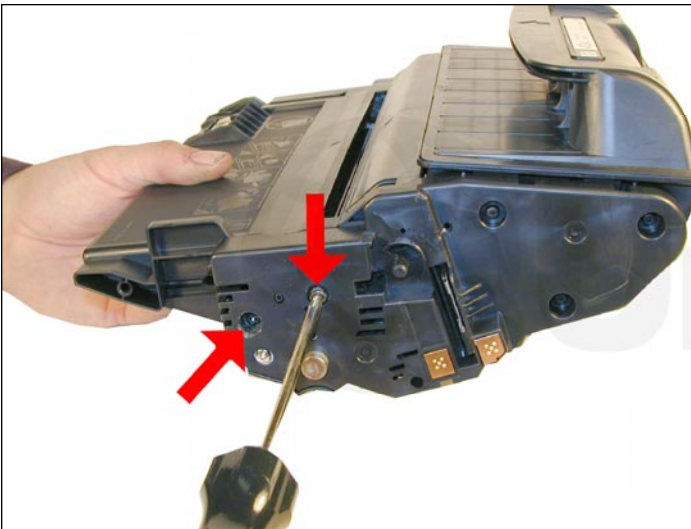
33. Install the keyed MRS cover. Make sure that the keyed hole in the cover matches the keyed end of the magnet in the MRS assembly.



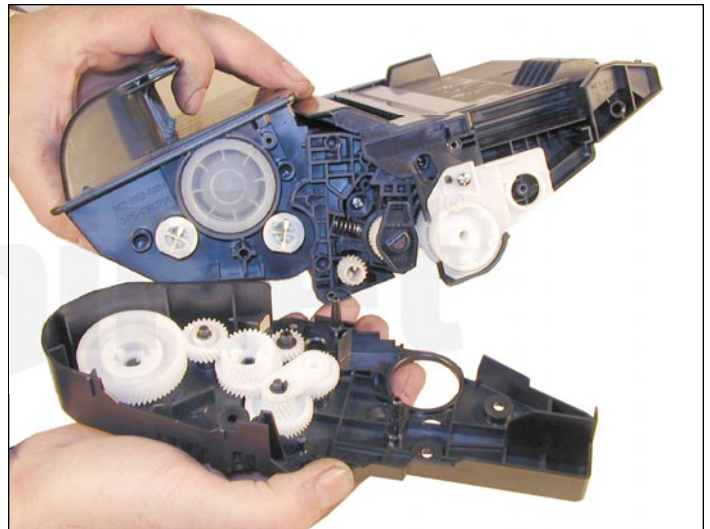
34. Fill with appropriate amount of toner.



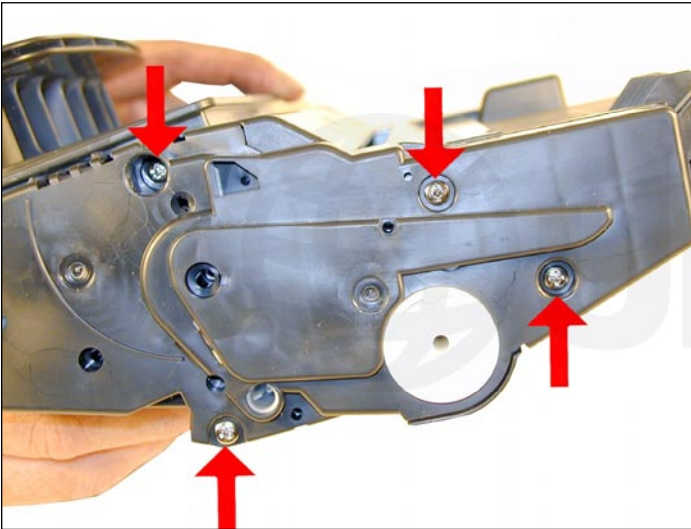
35. Install the waste section into the fixed end cap on the supply hopper. This is a tricky process the first few times, but gets much easier. The best way to do it is to carefully pull the end cap out, and slide the waste up and in, until everything aligns. For the first few times, this is definitely easier said than done, but you will get the hang of it.



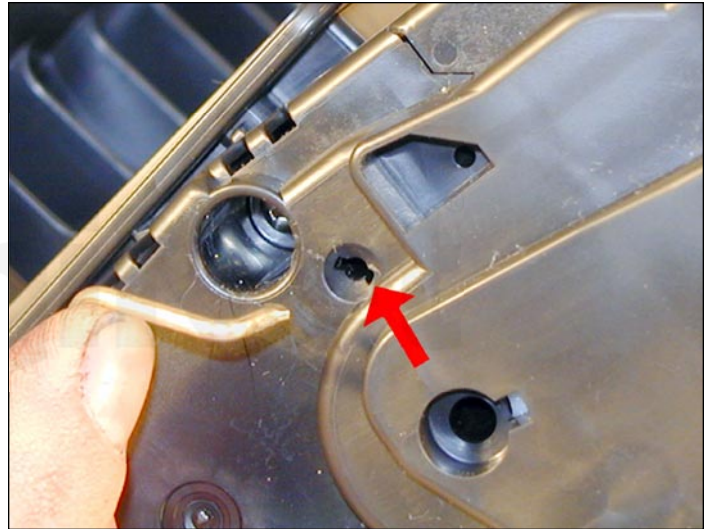
36. Install the two screws into the end cap in the holes that were drilled out previously.



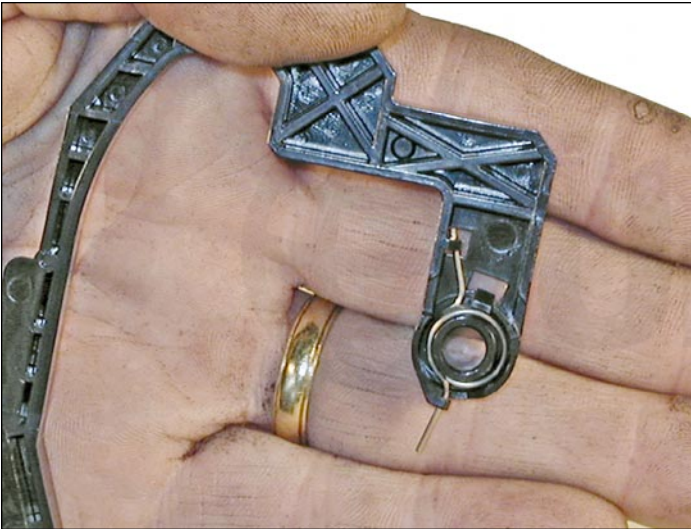
37. Install the left side end cap.



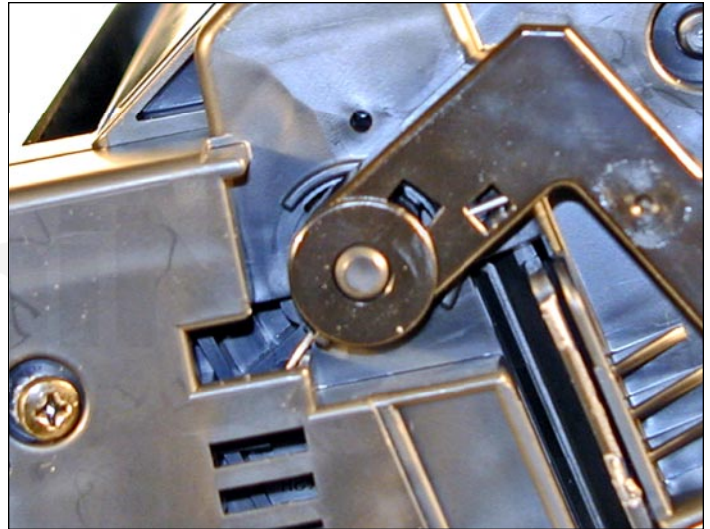
38. Install the four screws.



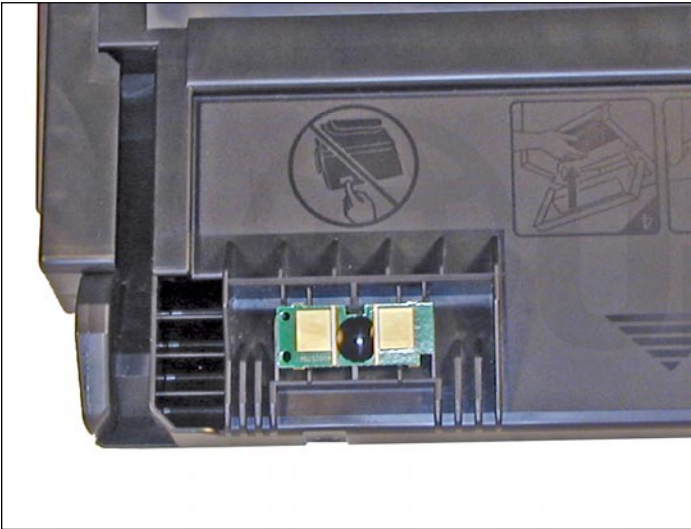
39. Install the metal bars from the drum cover on both sides of the cartridge. You will have to turn the bars so that the flattened end of the bars fit into the keyed slots.



40. Install the spring into the drum cover arm as shown. Pull the upper tail of the spring until it fits into the notch in the arm hub.



41. Install the arm onto the cartridge. Release the spring from the notch so that the tail fits as shown.



42. Replace the chip on the top of the cartridge. Replacing this chip will enable the toner low functions of both the cartridge, and the machine again.

COMMON CARTRIDGE PROBLEMS

Repetitive Defect Chart

OPC drum:	94 mm
Magnetic roller sleeve:	55 mm
PCR:	38 mm

Dirty or Bad Primary Charge Roller (PCR)

A bad PCR will normally cause a gray background, or ghosting. Small defects from the PCR will repeat every 38 mm.

Dirty PCR Connection

This will show as horizontal dark black bars across the page, or as shading throughout the page.

Scratched Drum

This is shown by a very thin, perfectly straight line that runs from the top to the bottom of the test page.

Chipped Drum

This will show as a dot or series of dots that repeat 3 times per page or every 95 mm. Any drum defects will repeat three times per page (94 mm).

Light Damaged Drum

This will show up as a shaded area on the test print that should be white. Again this will repeat three times per page.

“Tire” Tracks

This is normally caused by a bad drum. They normally show up on the right edge of the page.

Damaged Magnetic Roller Sleeve

A damaged Magnetic Roller Sleeve will leave a mark that repeats every 55 mm.

RUNNING THE CLEANING PAGE

1. Press the MENU Button
2. Press the DOWN ARROW" until CONFIGURE DEVICE appears
3. Press the SELECT Button
4. Press the DOWN ARROW" until PRINT QUALITY appears
5. Press the SELECT Button
6. Press the DOWN ARROW" until PROCESS CLEANING PAGE appears
7. Press the SELECT Button
8. Follow the instructions on the cleaning page to complete.

RUNNING TEST PAGES

1. Press the SELECT Button
2. Press the DOWN ARROW until INFORMATION appears
3. Press the SELECT Button
4. Press the DOWN ARROW until either PRINT MENU MAP, CONFIGURATION PAGE, SUPPLIES STATUS PAGE, or PS or PCL FONT LIST appears
5. Choose the page(s) desired
6. Press the SELECT Button

RESETTING THE MAINTENANCE KIT COUNTER

Every 200,000 pages, the machine will call for a new maintenance kit. This kit consists of the fuser assembly, transfer roller, paper pickup rollers, and the paper feed rollers. Once the kit has been replaced, the counter must be reset.

1. Turn the printer off and then on.
2. When XXX appears on the display, press and hold the SELECT button.
3. Continue holding the SELECT button until all three control panel lights flash once and then stay on. This process can take as much as 10 seconds.
4. Release the SELECT button and press the UP button until NEW MAINTENANCE KIT appears on the display.
5. Press the SELECT button to reset the counter.

PRINTER ERROR CODES

With these machines, HP has started to move away from number-only codes. Most are self explanatory in text, but there are still a few part-text and part-number codes that we will list here:

10.XX.YY Supply Memory Error

An error has occurred in one or more of the printer's supplies. Values of **XX** and **YY** are listed below:

- XX00:** **Memory is defective**
XX01: **Memory is missing**
YY00: **Black print cartridge**

This seems to indicate that other supplies such as the staple cartridge will be chipped also. No other products were available at the time of this writing to see if they do.

10.32.00 Unauthorized Supply Error

The printer has detected that a printer supply is not a genuine HP supply. It no longer displays a "Non-HP" message. It now displays "Unauthorized Supply!"

13.XX.YY Paper Jam Error

All the error 13 codes deal with paper jams. There will always be a text message under the number code tell you where the jam is.

- 41.X:** **Printer error**
50.X: **Fuser error**
51.X: **Printer error**
52.X: **Printer error**
53.XY.ZZ: **Printer memory error**
59.XY: **Temporary printer error**

Many of the codes also have sub codes for the "X" and "Y" values. All other codes are self-explanatory.